

Installation Instructions

LMO5/OML Series Multipoise Oil Fired Furnace

SAFETY CONSIDERATIONS

Installation of fired heating units shall be in accordance with the regulation of authorities having jurisdiction and the CAN/CSA B139 or USA/NFPA No. 31-1983 installation code for oil burning equipment.

DO NOT operate furnace in a corrosive atmosphere containing chlorine, fluorine or any other damaging chemicals.

DO NOT store or use gasoline, or other flammable vapors and liquids in the vicinity of this or any other appliance.

The chimney is a very important part of your heating system. It must be the right size, properly constructed and in good condition. Chimney should be sized in accordance with the regulations of authorities having jurisdiction and the latest CAN/CSA B139 or USA/NFPA No. 31-1983 installation code for oil burning equipment.

Oil fired appliances shall be connected to flues having sufficient draft at all times to ensure safe and proper operation of the appliance. Before connecting the vent connector to a chimney, examine all parts and the passageway for condition and to make sure it is clean and clear, free of obstructions, and no air leaks in flues or at the cleanouts access.

Maximum capacity of individual tank used shall be 250 gallons and must be located at least 5' from the appliance. Local codes will govern the size of vents and fillers as the type of caps used. 1 $\frac{1}{4}$ " IPS and 2" IPS are generally accepted as minimum sizes for vent and fill pipes respectively. The burner oil line shall not be less than $\frac{3}{8}$ " O.D. copper tubing for runs 50' or less and $\frac{1}{2}$ " O.D. copper tubing for longer runs. A manual shut-off valve and an oil filter shall follow in sequence from tank to burner. Be sure that the oil line is clean before connecting to the burner. The oil line should be protected to eliminate any possible damage. Installation having the fuel oil tank below the burner level must employ a two pipe fuel supply system with an appropriate fuel oil pump (more than 8' lift use 2 stage pump and more than 16' an auxiliary pump).

Table of Contents

1. Safety Labeling and Signal Words	2	4. Installation	5
2. Safe Installation Requirements	3	5. Oil Burner	8
3. Locating the Furnace	4		



International Comfort Products Corporation (USA)
Lewisburg, TN USA 37091

1. Safety Labeling and Signal Words

Danger, Warning and Caution

The signal words **DANGER**, **WARNING** and **CAUTION** are used to identify levels of hazard seriousness. The signal word **DANGER** is only used on product labels to signify an immediate hazard. The signal words **WARNING** and **CAUTION** will be used on product labels and throughout this manual and other manuals that may apply to the product.

Signal Words

DANGER – Immediate hazards which WILL result in death or serious injury.

WARNING – Hazards or unsafe practices which COULD result in death or injury.

CAUTION – Hazards or unsafe practices which COULD result in personal injury or product or property damage.

Signal Words in Manuals

The signal word **WARNING** is used throughout this manual in the following manner:

WARNING

The signal word **CAUTION** is used throughout this manual in the following manner:

CAUTION

Product Labeling

Signal words are used in combination with colors and/or pictures on product labels. Following are examples of product labels with explanations of the colors used.

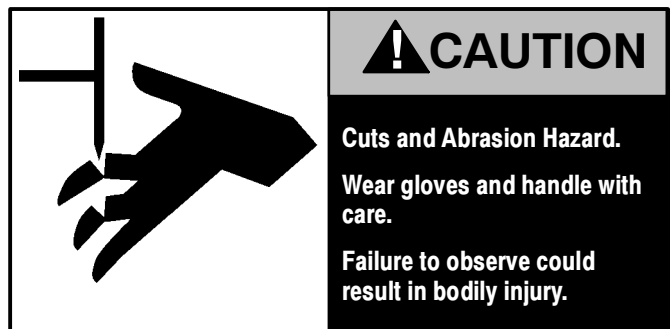
Danger Label

White lettering on a black background except the word **DANGER** which is white with a red background.



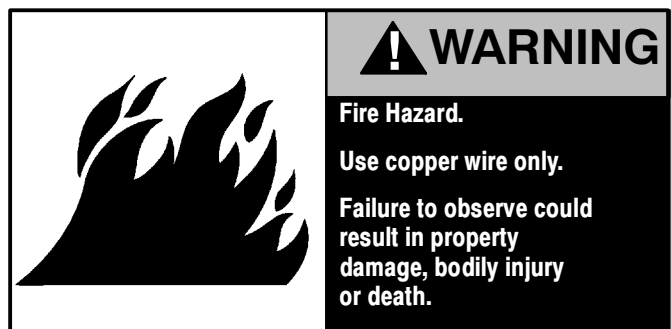
Caution Label

White lettering on a black background except the word **CAUTION** which is black with a yellow background.



Warning Label

White lettering on a black background except the word **WARNING** which is black with an orange background.



Burner No. _____ Model _____ Date of Installation _____

Service Telephone: Day _____ Night _____

Dealer's Name and Address _____

REPORT OF TEST

Date of Test _____

CO² _____ % Stack Net _____

Draft: at Stack _____ Over Fire _____

Firing Rate _____ GPH/US

Smoke No. _____

Note _____

Test Made By _____

2. Safe Installation Requirements

WARNING

Installation or repairs made by unqualified persons can result in hazards to you and others. Installation **MUST** conform with local codes or, in the absence of local codes, with codes of the country having jurisdiction.

The information contained in this manual is intended for use by a qualified service technician familiar with safety procedures and equipped with the proper tools and test instruments.

Failure to carefully read and follow all instructions in this manual can result in furnace malfunction, property damage, personal injury and/or death.

NOTE: It is the personal responsibility and obligation of the customer to contact a qualified installer to ensure that the installation is adequate and conforms to governing codes and ordinances.

WARNING

The furnace must be installed in a level position, never where it will slope to the front.

If the furnace were installed in that position, oil would drain into the furnace vestibule and create a fire hazard, instead of draining properly into the combustion chamber.

- This furnace is **NOT** approved for installation in mobile homes, trailers or recreation vehicles.
- You must have a sufficient supply of fresh air for combustion and ventilation to the area in which the furnace is located.
- Do **NOT** use this furnace as a construction heater or to heat a building that is under construction.
- Use only the Type of fuel oil approved for this furnace (see **Rating Plate** on unit). Overfiring will result in failure of heat exchanger and cause dangerous operation.
- Visually check all oil line joints for signs of wetness which would indicate a leak.

- Connect furnace to a masonry or Class A prefabricated chimney only.
- The "*Check and Adjustments*" starting on page 7 are vital to the proper and safe operation of the heating system. Take the time to be sure they are all done.
- Follow the rules of the NFPA Pamphlet No. 31 or local codes for locating and installing the oil storage tank.
- Follow a regular service and maintenance schedule to efficient and safe operation.
- Before servicing, allow furnace to cool. Always shut off electricity and fuel to furnace when working on it. This will prevent electrical shock or burns.
- Seal supply and return air ducts.
- The vent system **MUST** be checked to determine that it is the correct type and size.
- Install correct filter type and size.
- Unit **MUST** be installed so electrical components are protected from direct contact with water.

Safety Rules

Your unit is built to provide many years of safe and dependable service providing it is properly installed and maintained. However, abuse and/or improper use can shorten the life of the unit and create hazards for you, the owner.

- A. The U.S. Consumer Product Safety Commission recommends that users of oil-burning appliances install carbon monoxide detectors. There can be various sources of carbon monoxide in a building or dwelling. The sources could be gas-fired clothes dryers, gas cooking stoves, water heaters, furnaces, gas-fired fireplaces, wood fireplaces, and several other items. Carbon monoxide can cause serious bodily injury and/or death. Therefore, to help alert people of potentially dangerous carbon monoxide levels, you should have carbon monoxide detectors listed by a nationally recognized agency (e.g. Underwriters Laboratories or International Approval Services) installed and maintained in the building or dwelling (see Note below).
- B. There can be numerous sources of fire or smoke in a building or dwelling. Fire or smoke can cause serious bodily injury.

ry, death, and/or property damage. Therefore, in order to alert people of potentially dangerous fire or smoke, you should have fire and smoke detectors listed by Underwriters Laboratories installed and maintained in the building or dwelling (see Note below).

Note: The manufacturer of your furnace does not test any detectors and makes no representations regarding any brand or type of detector.

- C. To ensure safe and efficient operation of your unit, you should do the the following:

1. **Thoroughly read this manual and labels on the unit.** This will help you understand how your unit operates and the hazards involved with gas and electricity.
2. **Do not use this unit if any part has been under water.** Immediately call a qualified service technician to inspect the unit and to replace any part of the control system and any gas control which has been under water.
3. **Never obstruct the vent grilles, or any ducts that provide air to the unit.** Air must be provided for proper combustion and ventilation of flue gases. Carbon monoxide or "CO" is a colorless and odorless gas produced when fuel is not burned completely or when the flame does not receive sufficient oxygen.

3. Locating the Furnace

Location

Locate the furnace as closely as possible to the chimney, providing ample clearance to permit easy accessibility for cleaning the inside of the furnace, the removal of filters, blower, motors controls and flue connections.

Minimum Installation Clearances from Combustible Materials	
Supply Plenum - Top & Sides	1"
Flue Pipes	9"
Sides - Other Side	1"
Front - From Burner	24"
Rear	1"
Front - For Service	30"

NOTE: With MULTIPOISE FURNACE

The return air connection can be made to either or both sides or through the bottom of the unit.

Following the markings make the opening on the selected side. Fix the air filter rack and the ducts. (**Figure 1**)

Return by the side can be used for VERTICAL UP or DOWN.

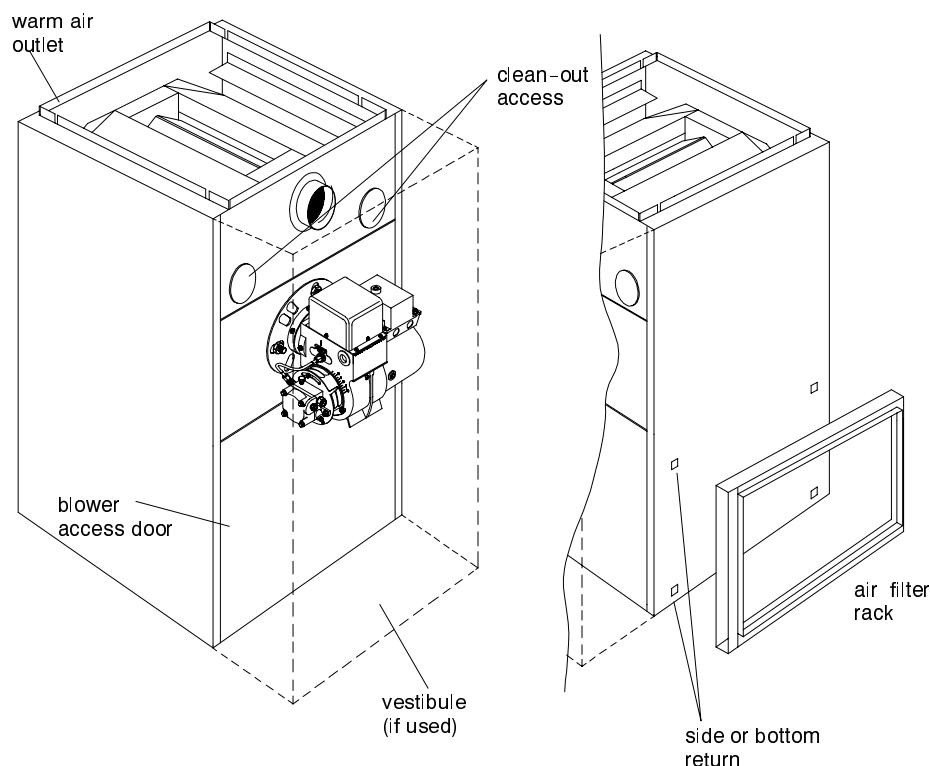
Return through the bottom is recommended for HORIZONTAL installation and DOWNFLOW.

NOTE: Return air through the back of the units is **NOT** allowed.

A/C coil must be installed in the warm air supply plenum.

If the unit is installed with the vestibule cover, open the knock out to permit the installation of the flue elbow.

Figure 1



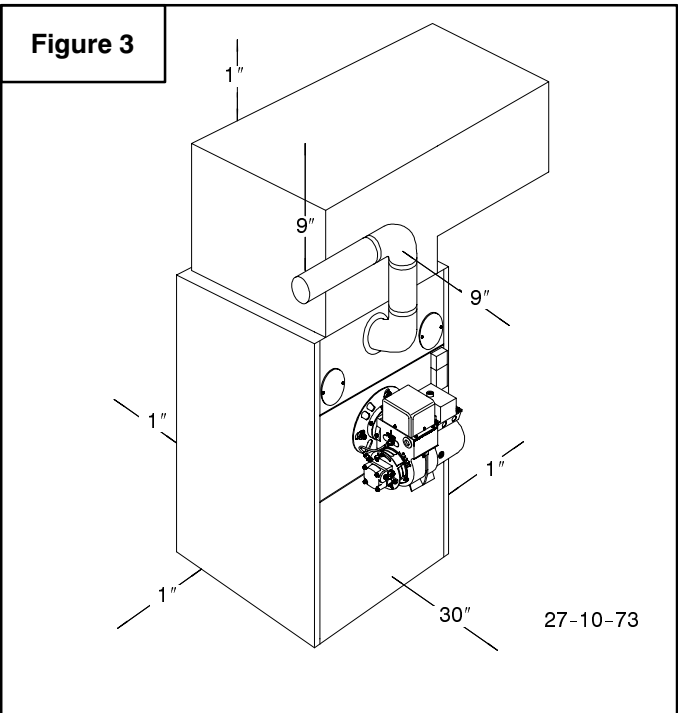
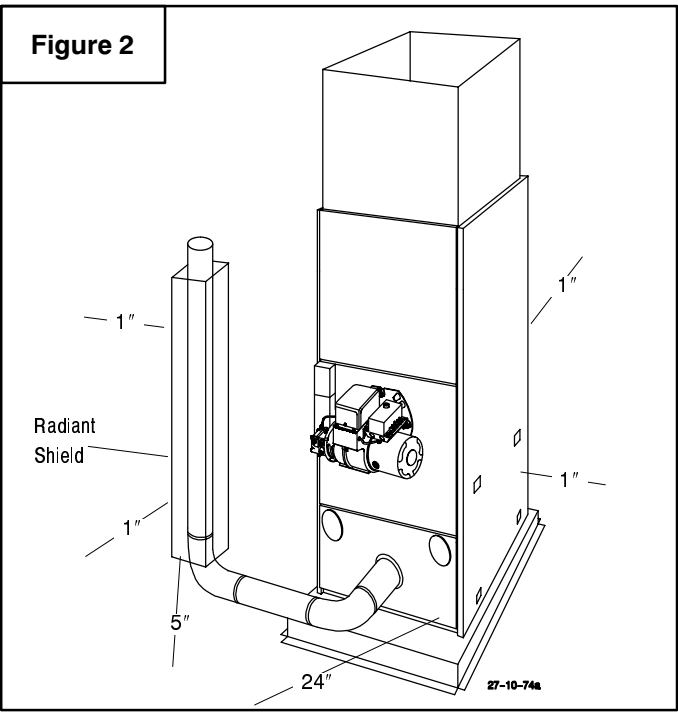
27-10-70

4. Installation

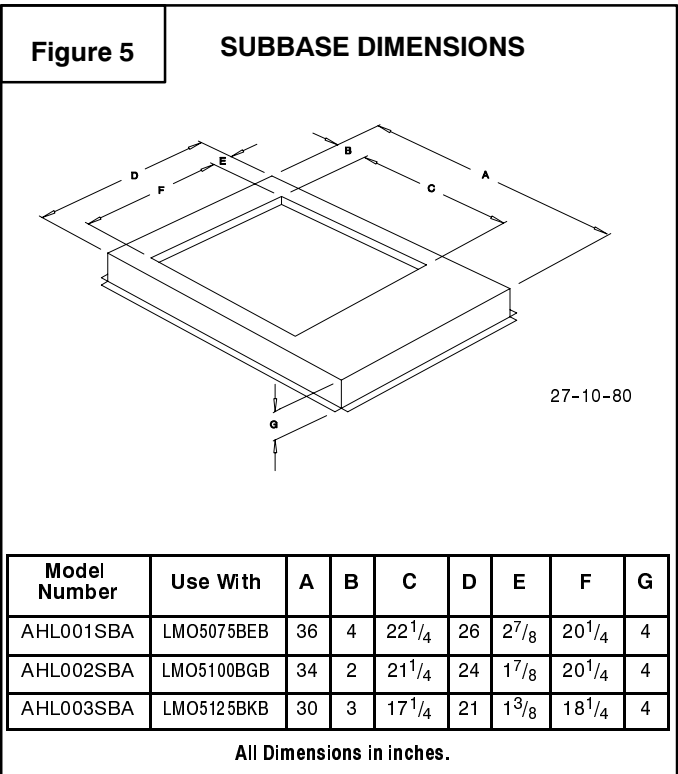
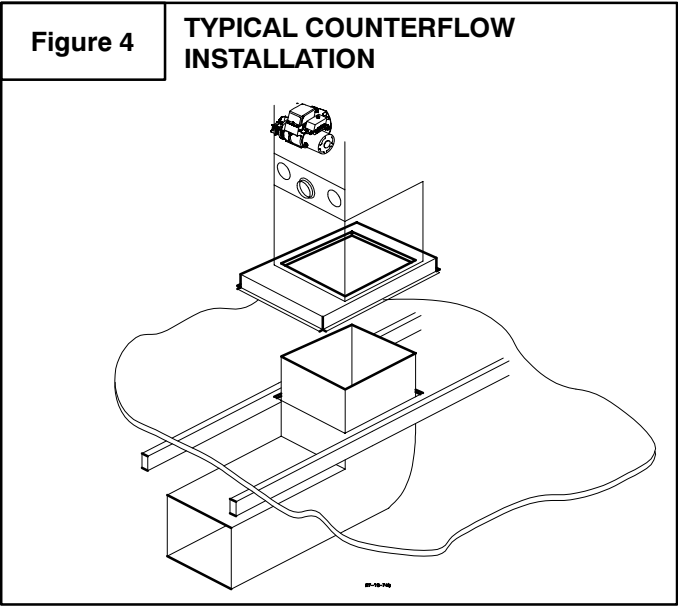
This furnace can be installed UPFLOW, DOWNFLOW, HORIZONTAL RIGHT HAND SIDE or LEFT HAND SIDE. Only the burner must be rotated for downflow or horizontal, to have the ignition transformer on top.

This furnace is listed to be used with clearances between bottom combustible material and the unit: (Figure 2 & 3)

ABOVE	1"	FRONT	30" (service)
SIDES	1"	FLUE PIPE	9"
BACK	1"	FLOOR COMBUSTIBLE	1"

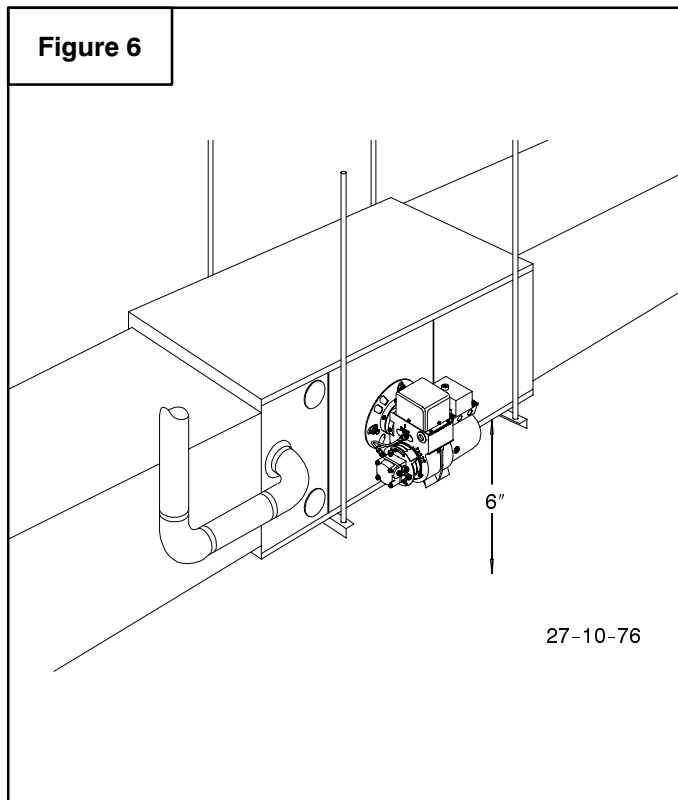


For downflow installation you need the subbase. (Figure 4) It is not permitted to make the installation on a combustible floor and you could use the radiation shield around the flue pipe to reduce the clearance section flue pipe and combustible material.(Figure 2)



For suspend horizontal installation use steel angle 1 1/2" x 1 1/2" x 3/16" with threaded rod O 1/2".

6" clearance to combustible material, from the furnace base. (Figure 6)

Figure 6

Make all line voltage and ground connections with copper wires #14 AWG 90° C from a 15 Amp power supply circuit through the unit (20 Amp. circuit for LMO5125BKA, OML125B20A).

Filters

The furnace should never be operated without filters. In addition to permitting circulation of dust and other suspended particles, there is a possibility of bearing failure resulting from these foreign materials in the blower and motor housing. Clean or replace filters once each month. Filters must be replaced only with same type and size certified U.L.C. for Canada and U.L. for USA.

NOTE: A dirty air filter causes inefficiency and higher operating costs.

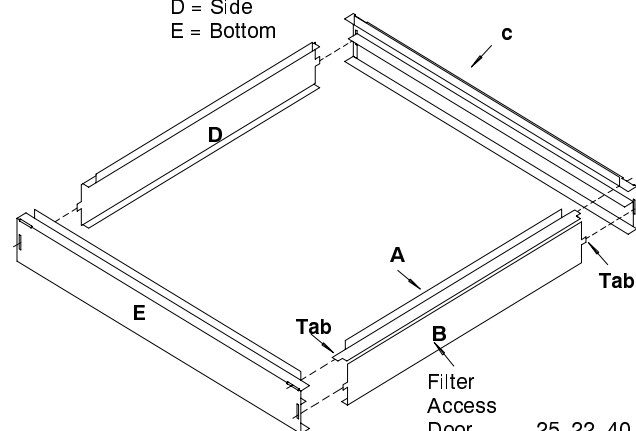
Filter Installation (Figure 7)

1. Insert tab **D** into slots **C** and **E**, then bend down with pliers.
2. Insert tab **A** into slots **C** and **E**, then bend down with pliers.

Figure 7

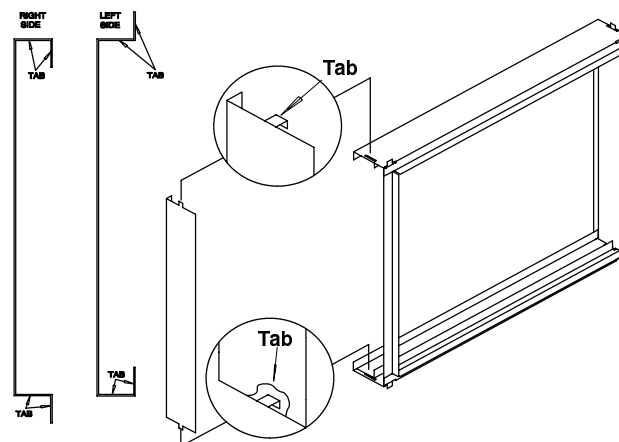
PARTS

A = Angle
B = Filter Access Door
C = Top
D = Side
E = Bottom



3. Bend both tabs of **B** 90° up or 90° down. (**Figure 8**)

Note: Right side installation bend tab down.
Left side installation bend tab up.

Figure 8

4. Attach filter access door to filter rack with bent tabs.

Combustion Air

Furnaces require ventilation openings to provide sufficient air for proper combustion and ventilation of flue gases. All ducts or openings for supply combustion and ventilation air must comply with the latest Oil Burning Equipment Installation Code CAN/CSA B139 of USA/NFPA No 31-1983.

Positioning the Unit

The furnace must be level in both directions for safe quiet operation.

Flue Connections and Draft Regulator

Vent pipe must comply with the latest installation Code CAN/CSA B139 of USA/NFPA No 31-1983.

Use vent pipe same size or smaller as the furnace vent outlet. Slope horizontal run upward to chimney at least $\frac{1}{4}$ " for every foot of pipe. Size vent per furnace input nozzle.

Keep piping as short and direct as you can. Horizontal run should not be longer than 10 feet. If more than 10 feet, use "L" vent pipe.

Install the Draft Regulator, (field supplied) in a straight section as close to the furnace outlet as possible. Follow installation instructions from the Draft Regulator manufacturer.

Adjust Draft Regulator for a minimum of -0.005 inch of water over fire.

Wiring

Turn off electric power at fuse box or service panel before making any electrical connections and ensure a proper ground connection is made before connecting line voltage.

All electrical wiring must conform with local codes, ordinances and the Canadian Electrical Code or USA/NFPA No 70-1990.

Fan Control

Fan side of the fan and limit switch should not be higher than 110° F for "fan on" and 95° F setting for "fan off".

Adjustment of all controls should only be made by a competent serviceman. Control setting and blower speed should be in accordance with the recommendations of the National Warm Air Heating and Air Conditioning Association.

Summer Fan Operation

During the summer, continuous air circulation can be obtained by pushing the manual fan switch from "auto" position to the "on" position.

High Limit Control

This unit has two high limits one near the heat exchanger (fan and limits control), and the other one on the blower partition (therm-o-disc). High limit cut-off is factory set. This setting may be reduced but should never be increased.

A replacement limit control must be identical to that supplied as original equipment (See Parts List).

The limit control must be equipped with the air baffle under the limit control element.

Combustion Safety Control

Operation and checking of the primary control is outlined in detail with the burner manufacturer literature.

Burner Start Up

Before starting the burner, be sure the fuel tank is adequately filled with clean oil (Use No. 2 furnace oil) and the blower door is in place.

Adjust Air Flow

Model No.		Nozzle	Motor	Blower Size	Motor Speed 0.20" ESP	Motor Speed 0.50" ESP	Air Filter	Temperature Rise
OML075B10B	LMO5075BEB	0.50 0.60 0.65	1/3	10-8T	Low Low Low	Low Med. High High	16" x 20"	58° to 65° 65° to 75° 75° to 77°
OML00B14B	LMO5100BGB	0.75 0.85	1/2	11-7T	Med. Low Med. High	Med. High Med. High	20" x 24"	59 to 71° 64° to 68°
OML125B20B	LMO5125BKB	0.90 1.00 1.10	3/4	12-9T	Low Low Med. Low	Low Med. Low Med. High	20" x 25"	60° to 68° 65° to 73° 70° to 74°

Oil nozzle 70° spray w

Motors are four speed motors, which are easily adaptable to varying air flow requirements by changing the blower speed tap used. Select the speed tap that provides the temperature rise shown in table-above.

Fan speed must be checked for air temperature rise through the furnace.

Select the speed of the motor to reach temperature rise shown.

Air temperature rise is the temperature difference between supply and return air.

Shutting Burner Off

1. Turn off disconnect switch.
2. If closing down for the summer, close the valve(s) in the suction line.

The burner is to be adjusted so that the smoke density is no greater than No. 1 on the Shell-Bacharach test scale. The flue gases should contain between 10¹/₂% to 13% CO² when tested with combustion test equipment.

You may notice a slight odor the first time your furnace is operated, this will soon disappear. It is only the oil used on the parts during manufacturing.

5. Set the thermostat to call for heat.
6. Open the shut-off valve in the oil supply line to the burner.
7. Close the line switch to start the burner. If the burner does not start immediately, reset the manual overload which on the burner motor if so equipped, and the safety switch of the burner primary control.
8. Vent the fuel unit as soon as the burner starts rotating. To vent, attach a clear plastic hose over the vent plug, loosen the plug and catch the oil in an empty container. Tighten the plug when all the air is purged.
9. Make all the burner adjustments accordingly to the burner instruction book.
Burners listed: BECKETT AFG F3

Checks and Adjustments

1. Operate the furnace long enough for flame to become steady. (15 minutes from cold start).
2. Adjust Draft Control to obtain -0.005 inch of water over fire (minimum).
3. Adjust the smoke density at No. 1 on the Shell-Bacharach smoke test scale.
4. Insert the CO² analyzer tube in vent pipe. The reading should be between 10¹/₂% to 13%.

Restart if Burner Should Stop

1. Open observation door, wait 5 minutes to allow the combustion chamber to cool and the oil vapor to pass up the chimney.
2. Close the observation door when vapor has disappeared.
3. Press the reset button on the burner motor.
4. Press the reset button on the primary control only once.
5. If the burner motor does not start or ignition fails, turn off the disconnect switch.

CALL YOUR SERVICEMAN

DO NOT ATTEMPT TO START THE BURNER WHEN EXCESS OIL HAS ACCUMULATED, WHEN THE FURNACE IS FULL OF VAPOR, OR WHEN THE COMBUSTION CHAMBER IS VERY HOT.

ALWAYS KEEP THE FUEL SUPPLY VALVE IN THE OFF POSITION IF THE BURNER IS UNUSED DOWN FOR AN EXTENDED PERIOD OF TIME.

Furnace Maintenance

Turn off power to furnace before any disassembly or servicing.

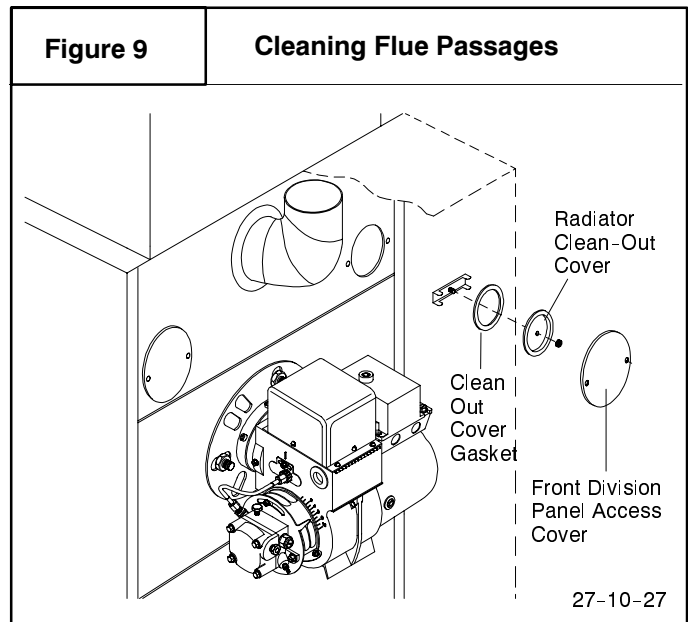
Burner compartment and blower compartment should be cleaned annually. Remove any dirt and lint that may have accumulated.

The bearings on the direct drive motor are permanently lubricated and do not require oiling.

Replace disposable type air filters before they become clogged by same type, size and ULC or UL certified as the original.

The furnace and flue pipe should be cleaned once a year by a qualified service technician.

1. Interrupt electric supply.
2. Remove front door from the furnace (if vestibule used).
3. Remove the two screws that secure each of the two front division panel access covers. Remove the covers.
4. Loosen the nut that secures each of the radiator clean out covers. It is not necessary to completely take them off.
5. Shift covers slightly to disengage the holding clamp inside the radiator. Lift out being careful of not to damage the gasket.
6. Vacuum these passages as far back as the cleaning tool will reach.



CAUTION

Do NOT use any commercially available soot remover. This furnace has fiber type refractory combustion chamber. Normal servicing of this unit does not require cleaning of the combustion chamber. Use extreme care if for any reason you have to work in the area of the combustion chamber.

7. Replace the parts in reverse order after the passages are cleaned. Be careful not to damage the gaskets.

5. Oil Burner

Once a year, prior to the beginning of the heating season have your oil burner inspected by your Service Technician. To inspect it:

1. Check firing head and clean if necessary.
2. Re-adjusting electrode setting before replacing.
3. Replace nozzle.
4. Adjust the burner.

Nozzle position and electrode adjustment (See Burner instruction book.)

DO NOT TAMPER WITH THE UNIT OR CONTROLS. CALL YOUR SERVICE TECHNICIAN.

BEFORE CALLING FOR SERVICE, CHECK THE FOLLOWING:

1. Check oil tank gauge and check if the oil tank valve in oil is open.
2. Check fuse or circuit breaker.
3. Check if shut-off switch is "ON".
4. Reset thermostat above room temperature.
5. Reset the manual overload on the burner motor and the safety switch of the primary control.
6. If the ignition does not appear turn off the disconnect switch and call your service technician.

IF COMBUSTION CHAMBER HAS TO BE REPLACED, THE INSTALLATION INSTRUCTIONS OF THE CHAMBER WILL BE WITH THE CHAMBER.

WHEN ORDERING REPLACEMENT PARTS SPECIFY THE COMPLETE FURNACE MODEL NUMBER.